

CHAPTER I

INTRODUCTION

1.1. Background

Mathematics is one of the main subjects in formal education in Indonesia. According to Gravemeijer et al. (2017: 8), the purpose of mathematics education is to prepare students to apply mathematics to all types of work and daily life situation. According to Asikin (2012:61), learning mathematics in schools has several objectives: (1) organizing the logic of students' reasoning and building their personality and (2) making students be able to solve mathematical problems and apply mathematics. Thus, problem solving ability is the basic ability that each student must possess and master.

The National Council of Teacher of Mathematics (NTCM) (2000:4) states mathematical problem solving ability is a person's ability or potential by applying the mathematical knowledge he has acquired in the process of discovering the combination of a number of rules applied in finding a way out of trouble.

Furthermore, NTCM states that problem solving should underlie all aspect of mathematics teaching in order to give students experience of the power of mathematics in the world around them. The council sees problem solving as a means for students to construct, evaluate and refine their own theories about mathematics and the theories of others. Relating to the above explanation, problem solving is an important component of mathematics education.

Problem-solving is also a cognitive process. It is important because it helps students become effective problem solvers by applying logical, critical, and creative thinking to a range of problems (Wilson, 1993:41-42). Problem-solving can provide the site for learning new concepts and for practicing learned skills (Kilpatrick, Swafford & Findell, 2001:98). According to Rossman (1993:15), when students use problem solving competence, the role of the student changes

from a passive recipient of information to a participant in the creation of understanding. Thus, the literature encourages the development of problem-solving competence as necessary for career success (Gustin, 2001; and Zekeri, 2004).

Students have mathematics problem solving ability when they fulfill the required indicators of problem solving. There are four indicators of mathematical problem solving according to Polya (1973:5), namely: (1) *Understanding the problem*, i.e. able to make what (data) is known, what is unknown (asked), what information is adequate, what condition must be met, and restates the original problem in a more operational form, (2) *Devising a plan*, i.e. by trying to find or recall problems that have been resolved that have similarities to the problem to be solved, to search for patterns or rules, and to prepare a settlement procedure (make conjecture), (3) *Carrying out the plan*, i.e. to execute the procedures that have been made to obtain the settlement and see clearly that each procedure or step is correct, and (4) *Looking back*, i.e. checking how the results are obtained, checking the rebuttal, searching for results in another way, see if the results can be viewed at a glance, see if all the data is used to solve the problem and check whether the result or how it can be used for other questions.

Based on the result of observation in class VII SMP Negeri 1 Labuhan Deli on February 25th 2020, it was found the ability of mathematical students problem-solving are still low. Low mathematical problem-solving ability is founded in the VII-1 class which consist of 31 students through a diagnostic test. Diagnostic test conducted by the researcher by giving the problem to see students' mathematical problem-solving ability. In this research, the researcher chose two topics of mathematics which students had studied in odd semester.

Based on the result of problem solving ability diagnostic test, many students can not understand the problem, to have the convert to mathematics model, solving the problem exactly and looking back their solution exactly. Furthermore, the result of diagnostic test are : 1) *Understanding the problem*. In problem 1 and 2, there are 74% of students have been understood the problem well and 26% of

students have not been understood the problem or the condition that presented by the problem; 2) *Devising a plan*, students have been devised a plan there are 19% in problem 1 while 16 % in problem 2. Student have not been devised a plan to solve the problem there are 81% in problem 1 while 84% in problem 2; 3) *Carrying out plan*, students have been carried out the plan there are 29% in problem 1 while 38 % in problem 2. Student have not been carried out the plan and could not see clearly that the step is correct there are 71% in problem 1 while 62% in problem 2; 4) *Looking back*, students have been looked back carefully there are 6% in problem 1 while 13 % in problem 2. Student have not been looked back exactly is correct there are 94% in problem 1 while 87% in problem 2. This show that students still have low ability in problem solving.

However, learning achievement measured through in assessment of PISA (Program for International Student Assessment) surveys organized by the OECD (Organization for Economic Cooperation and Development) in 2006 showed that 41.3% of Indonesian students were at level one in solving problems. Based on these international assessments, it can be interpreted that Indonesian students have basic knowledge of mathematics but cannot be used in solving routine life problems such as choosing strategies and manipulating forms and spaces, as well as having basic scientific knowledge but can only be used to solve familiar problems (Tjalla,2009:24-25).

If student achievement is integrated with problem-solving skills related to a gender perspective, Since childhood, male students are known to be easier to recognize problems. However, their concern in solving these problems is lower than female students who tend to give more effort towards problem solving, so that it is often found male students lazing in the classroom when the learning process (D'Zurilla, Maydeu Olivares, and Kant, 1998 : 250251). This is related to differences in the development of the male brain with the female brain, in research M. Syahrudin Amin (2018:13) said the development of the right brain and left brain in women is balanced, whereas in men under the age of 18 where the right brain develops more dominant than the left one. Thus, we find many at school age students who are smart and excel (reading, writing, class champion, etc.) are

dominated by female students. This also triggers many male students to be naughty and throw tantrums.

In learning mathematics, a similar mathematical problem, for example, is given to several individuals, so they will get different responses / responses in solving them. The difference in how to solve it is because each individual has a uniqueness in himself. Another thing that might give rise to individual differences in responding to a problem is the existence of gender differences. Mubeen, Saeed, & Arif (2013:17) explain that boys differ in the mathematical achievements of girls. Girls achieve better results compared to boys. Zhu (2007:38) found differences in mathematical solutions influenced by gender differences, differences in experience and differences in education. Furthermore the NAPLAN (National Assessment Program-Literacy and Numeracy) report says that boys regularly beat girls in counting, and girls consistently beat boys in reading, writing, spelling, and grammar (Leder, Forgasz , & Jackson, 2014: 58-59).

Although the achievements of female students are higher than male students. But this achievement cannot be described that female students are better able to solve problems, because in questions that test the problem-solving ability has not been associated in the evaluation. Material of number pattern is one of the materials in mathematics related to students' daily lives. So we need students' problem solving ability to be able to solve problems using steps in theory of polya. Therefore, this study was conducted to describe the problem solving ability of male students in solving mathematical problems and describe the problem solving ability of female students in solving mathematical problems. Based on description above, then the title in this research is **“Analysis of Students' Problem Solving Ability in Solving Mathematical Problems in Terms of Gender Differences in Eighth Grade Students at SMP Negeri 1 Labuhan Deli”**

1.2. Problem Identificaion

Based on description above, some problems can be identified as follow :

1. Students' mathematical problem-solving ability is still low.
2. Do not know the reason for the difference in problem solving skills in solving mathematical problems in male and female students.

1.3. Problem Limitation

In this research, problem boundary is needed to be more focused. Do not know the reasons for differences in problem-solving abilities in solving math problems among male and female students. Mathematical problems to be studied in this study are limited to the topic of number patterns and the learning model is not used, this study only provides a test of problem-solving abilities to students.

1.4. Problem Formulation

Based on several exposures that have been described in the background of the problem, the formulation of the problem in this research as follow :

1. How problem solving ability in male students in solving mathematical problem.
2. How problem solving ability in female students in solving mathematical problems.
3. How is the answer process for students' problem solving abilities in solving mathematical problems in terms of gender differences.

1.5. Research Objective

In connection with the problem above, the objectives to be achieved are:

1. To describe the ability of mathematical problem solving in male students
2. To describe the ability to solve mathematical problems in female students in solving mathematical problems.
3. To describe the answer process for students' problem solving abilities in solving mathematical problems in terms of gender differences

1.6. Research benefit

This research is expected will give the benefits as follows:

1. For teachers, to improve the quality of learning and professional development of teachers in teaching
2. For the researcher, additional insight, ability, information and experience as prospective teacher in the future.
3. For schools, it can be a reference for potential students to develop which spurs other teachers to make learning adjustments to gender differences

1.7. Operational Defenition

Terms are required in this study need to be defined operationally, in order to avoid misunderstandings and able to provide a clear direction in the study. Below will be explained about some of the terms used in this study, among others :

1. Students' mathematical problem-solvng ability

The students' problem-solving ability is a ability of students in solving mathematical problem, starting from understanding the problem, devising a plan, carrying out the plan untill looking back to the plan.

2. Mathematical Problems

Mathematical problem is the problem which requires action as a challenge, entire students or learners to be curious and challenged to solve it and it can be solved by using non routine procedure, so the solution needs a process to understand the problem and solve the problem.

3. Gender Difference

Gender is a concept of the social roles of men and women. this term applies to typical differences between men and women that are often specific to certain cultures in which domains as career, communication, health, social awareness and orientation to the environment are seen and ways of thinking. in this study focused on the different ways of solving problems between female and male students.